

Applicant: Andrew D. Hirzel
Application No: 10/048,128
Page 2 of 6

Amendments to the Specification

Kindly amend the specification at the Summary of the Invention as follows:

The invention relates to a voice coil actuator of the type comprising a coil, an armature, a housing and a magnet, wherein the armature is disposed at least partially within the housing and movable relative thereto and the coil and the magnet are disposed relative to each other so as to induce movement of the armature relative to the housing when the coil is energized by a current. At least one of the coil, the magnet and the housing are nonuniform in orientation relative to the armature, and the coil or the magnet is linearly tapered. Consequently, displacement of the armature relative to the housing will be substantially linearly proportional to the current flowing through the coil.

The invention relates to a voice coil actuator having an axially non-uniform coil a first embodiment includes a coil that varies linearly in an axial direction. The second embodiment of the coil varies exponentially in an axial direction, parallel to the direction of axial movement of the voice coil actuator. A second set of embodiments take advantage of magnet that is nonuniform in the axially direction. The magnet, or the coil, can vary in a continuous fashion such as a straight-line or in an ascertainable parabolic, hyperbolic, or circular curve, or can vary in a noncontinuous fashion, displaying in cross-section any number of discontinuities. Further, the housing of the voice coil actuator can be varied in cross-section to shape the magnetic fields within the actuator.

Other objects, features, and advantages of the invention will be apparent from the ensuing description in conjunction with the accompanying drawings.